

## CERTIFICATE OF TRANSLATION

As a below named translator, I hereby declare that my residence and citizenship are as stated below next to my name and I hereby certify that I am conversant with both the English and Korean languages and the document enclosed herewith is a true English translation of the Priority Document with respect to the Korean patent application No. 1997-29839 filed on 30 June 1997.

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**Date :** 22 July, 2003

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## **[ABSTRACT OF THE DISCLOSURE]**

### **[ABSTRACT]**

Disclosed is a method for displaying channel information in a digital television receiver for receiving digital multichannel TV broadcasts. The channel information displaying method enables a user to easily confirm programs being broadcasted on a selected RF channel. The method comprises the steps of confirming programs being broadcasted on a selected RF channel and displaying corresponding program numbers, together with the selected RF channel number, on a display of the digital TV receiver.

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### **[REPRESENTATIVE FIGURE]**

FIGURE 2

### **[INDEX]**

15

**[SPECIFICATION]**

**[TITLE OF THE INVENTION]**

METHOD FOR DISPLAYING CHANNEL INFORMATION IN  
DIGITAL TELEVISION RECEIVER

5

**[BRIEF DESCRIPTION OF THE DRAWINGS]**

FIG. 1 is a block diagram of a HDTV receiver to which the present invention is applicable;

FIG. 2 is a flow chart showing a process performed by a microprocessor  
10 of FIG. 1 according to a preferred embodiment of the present invention; and

FIG. 3 shows an example of displaying channel information according to the preferred embodiment of the present invention.

**[DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT]**

15 **[OBJECT OF THE INVENTION]**

**[RELATED FIELD AND PRIOR ART OF THE INVENTION]**

The present invention relates generally to a digital television ("TV") receiver for receiving digital multichannel TV broadcasts, and more particularly to a method for displaying channel information on a display of a digital TV  
20 receiver.

In analog TV broadcasting, such as NTSC (National Television System Committee) system based broadcasting, only a single program can be broadcasted on a fixed frequency bandwidth of one RF (radio frequency) channel.

By contrast, next-generation digital TV broadcasting, such as HDTV

(High Definition TeleVision) broadcasting, can deliver many more RF channels than the analog TV broadcasting. Also, digital TV broadcasting can flexibly assign appropriate bit rates to provided services, if required. In other words, a plurality of programs can be broadcasted within a limited transmission bandwidth of one RF channel. Thus, it is possible to broadcast SD (standard definition) programs, such as general analog TV broadcasting programs, on multiple channels in a particular time zone and HD programs on a single channel in another time zone. For example, according to the US ATSC (United States Advanced Television System Committee) standard, one RF channel equivalent to one analog channel is recommended to be subdivided into up to six sub-channels so that a digital TV can broadcast at least one HD program or up to 6 SD programs at the same time.

Since digital TV broadcasting transmits a plurality of programs on a single RF channel, it is required to display program guide information on a display of a digital TV receiver so that a user can select one of the plurality of programs. To this end, the ATSC standard defines an electronic program guide (EPG) to provide a method of selecting a program. That is, a TV station transmits EPG information of each RF channel. A digital TV receiver stores the received EPG information and displays it when the user wishes to see it.

From the EPG information, the user can confirm the number of programs being broadcasted on sub-channels of an RF channel. However, the user should separately select a display of the EPG information. In addition, it is troublesome to confirm the number of programs being broadcasted on a selected RF channel and select a desired program in digital broadcasting, as compared to

the existing analog TV broadcasting. Since a TV station may deliver both analog broadcasting and digital broadcasting, users may be further confused when selecting a channel and a program.

## **5 [SUBSTANTIAL MATTER OF THE INVENTION]**

As described above, in digital multichannel TV broadcasts, it is required for a user to easily confirm programs being broadcasted on a selected RF channel.

It is, therefore, an object of the present invention to provide a method for displaying channel information in a digital TV receiver to enable a user to easily  
10 confirm the programs being broadcasted on a selected RF channel.

## **[CONSTRUCTION AND OPERATION OF THE INVENTION]**

In order to accomplish the object, the present invention provides a method for displaying channel information in a digital TV receiver, comprising  
15 the steps of confirming programs being broadcasted on a selected RF channel, and displaying corresponding program numbers, together with the selected RF channel number, on a display of the digital TV receiver.

Hereinafter, a preferred embodiment of the present invention will be described with reference to the accompanying drawings. Although certain  
20 processes or pictures are specifically exemplified in the following description of the present invention and in the drawings, it will be obvious to those skilled in the art that such examples are merely to improve understanding of the present invention and that the present invention is not limited to such specific examples. Also, in the following description of the present invention, a detailed description

of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

FIG. 1 is a block diagram of a HDTV receiver adopting the MPEG (Moving Picture Expert Group) standard, to which the present invention is applicable. Referring to FIG. 1, a tuner 102 tunes an RF channel from broadcasting signals received through an antenna 100 under the control of a microprocessor 124, and outputs an intermediate frequency (IF) signal. An IF module 104 converts the IF signal into a baseband signal and outputs the baseband signal to a channel decoder 106. The channel decoder 106 decodes the baseband signal received from the IF module 104 and reproduces a data bit stream. The reproduced data bit stream is separated into audio data, video data and additional data by a TS (transport stream) decoder 108.

The audio data is applied to an audio decoder 110 to be decoded according to the MPEG standard or the Dolby AC-3 standard. An audio processing and outputting section 112 processes the decoded audio data and outputs it to a speaker 114. The video data is applied to a video decoder 116 to be decoded according to the MPEG standard. The decoded video data is applied to an OSG (On Screen Graphic) mixer 118 to be mixed with OSG data under the control of the microprocessor 124. A video processing and outputting section 120 processes the mixed data and outputs it to a display through a picture tube 122. The OSG data is required for the microprocessor 124 to display any information in the form of graphic or text on the display.

A keypad 130 and an IR (infrared) receiver 134 are connected to the microprocessor 124, which is a control section of the HDTV receiver, through a

user interface 128. The microprocessor 124 operates according to a command inputted from an IR remote 132 through the keypad 130 or the IR receiver 134, based on a program stored in a memory 126. The IR remote 132 can be a wireless mouse, such as an air mouse, or a remote controller (REMOCON). A  
5 command applied from the IR remote 132 is received as an IR signal by the IR receiver 134 and transmitted to the microprocessor 124 through the user interface 128. Also, additional data is applied to the microprocessor 124 from the TS decoder 108. The additional data includes EPG information as described above or PSI (program specific information) as defined in the MPEG standard.

10 The memory 126 comprises a ROM (read only memory) for storing a program of the microprocessor 124, a RAM (random access memory) for temporarily storing data according to the implementation of the program of the microprocessor 124, and an EEPROM (electrically erasable and programmable ROM) for storing various reference data.

15 The tuner 102, IF module 104, channel decoder 106, TS decoder 108, audio decoder 110, audio processing and outputting section 112, video decoder 116, OSG mixer 118, video processing and outputting section 120 and memory 126 as explained above are connected to each another via a bus 136 connected to the microprocessor 124.

20 FIG. 2 is a flow chart showing a process according to the preferred embodiment of the present invention which is applicable to a digital TV receiver, such as a HDTV receiver as explained above. The process as depicted in the flow chart includes the steps of confirming programs being broadcasted on a selected RF channel and displaying corresponding program numbers, together

with the selected RF channel number, on the display. The process is programmed in the ROM of the memory 126 to be implemented by the microprocessor 124.

The process for displaying channel information according to the preferred embodiment of the present invention will be explained in more detail with reference to FIGs. 1 and 2. When a user selects or moves to a particular RF channel (step 200), the microprocessor 124 undergoes step 202. The selection or change of channels is made by pressing a number key for inputting a desired channel number or a channel up/down key on the keypad 130 or the IR remote 132, or by implementing a channel prearrangement function.

At step 202, the microprocessor 124 confirms, from PSI or EPG information included in the additional data applied to the TS decoder 108, which programs are being broadcasted on the selected RF channel. At steps 204 and 206, the microprocessor 124 displays program numbers corresponding to the programs being broadcasted on the selected RF channel, together with the selected RF channel number, on the display, utilizing the OSG mixer 118.

FIG. 3 shows an example of displaying the program numbers and the selected RF channel number as channel information. Referring to FIG. 3, RF channel "32" is selected. Four programs with program numbers "201", "202", "203" and "204" (304, 306, 308 and 310) are being broadcasted on the RF channel "32". The program numbers 304, 306, 308 and 310 are displayed in numeric order in the horizontal direction, next to the RF channel number 302.

When moving to a particular channel, the user can easily confirm programs being broadcasting on that channel from displayed program numbers,



without the need to perform an additional operation.

If a predetermined period of time lapses after displaying the program numbers and the selected RF channel number at steps 204 and 206, the microprocessor 124 terminates the display of the program numbers and the  
5 selected RF channel number at step 208.

While the invention has been shown and described with reference to a certain preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended  
10 claims. Although only an application to a IDTV receiver has been described above, the present invention is also applicable to all digital TV receivers. Therefore, the present invention is not to be unduly limited to the embodiment set forth herein, but to be defined by the appended claims and equivalents thereof.

## 15 [EFFECTS OF THE INVENTION]

In accordance with the present invention as described above, when selecting or moving to a particular RF channel, the user can easily confirm programs being broadcasted on the selected RF channel.

## **[PATENT CLAIMS]**

1. A method for displaying channel information in a digital TV receiver for receiving digital multichannel TV broadcasts, comprising the steps  
5 of:  
confirming programs being broadcasted on a selected RF channel; and  
displaying corresponding program numbers, together with the selected  
RF channel number, on a display of the digital TV receiver.
- 10 2. The method according to claim 1, wherein said confirming step includes confirming said programs from an EPG (electronic program guide) transmitted to said RF channel.
- 15 3. The method according to claim 1, wherein said confirming step includes confirming said programs from PSI (program specific information) transmitted to said RF channel.
- 20 4. The method according to claim 1, wherein said displaying step includes displaying said program numbers in numeric order next to said RF channel number.
5. The method according to claim 1, wherein said displaying step includes terminating the display of said program numbers and said RF channel number after lapse of a predetermined time period.

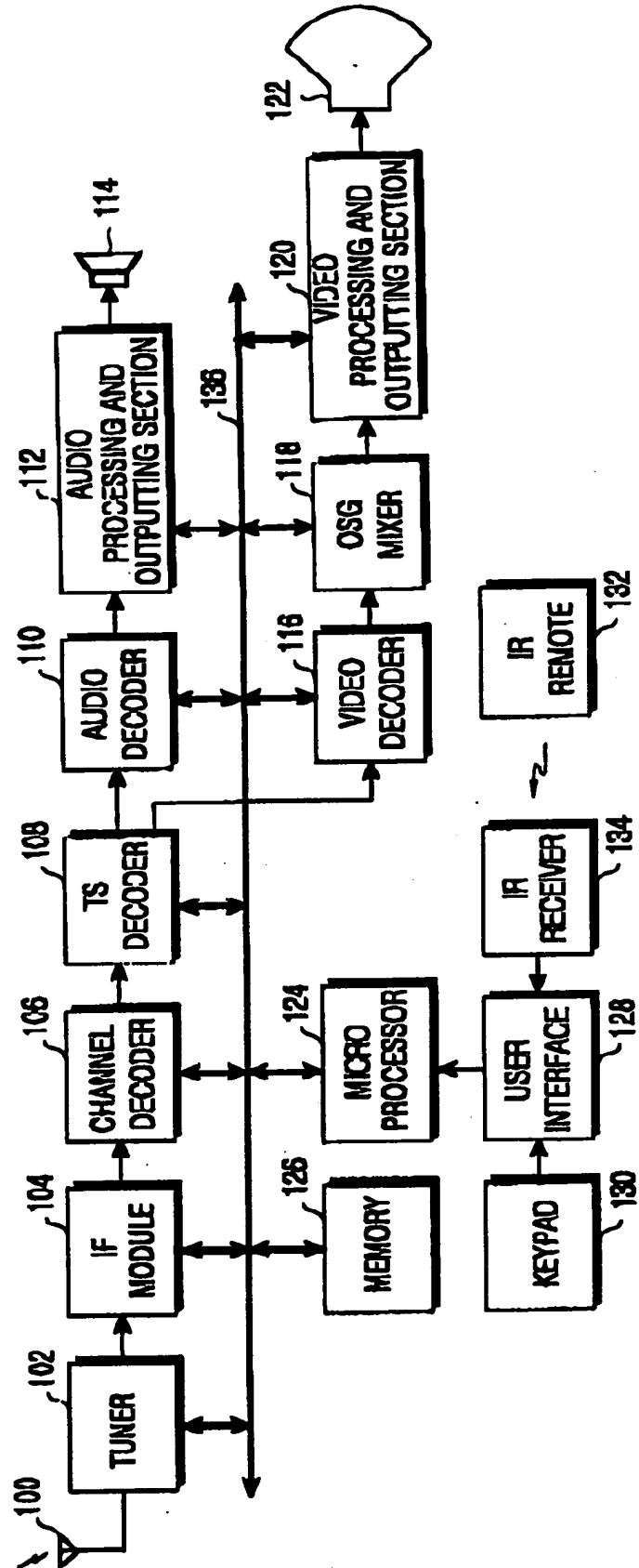


FIG.1

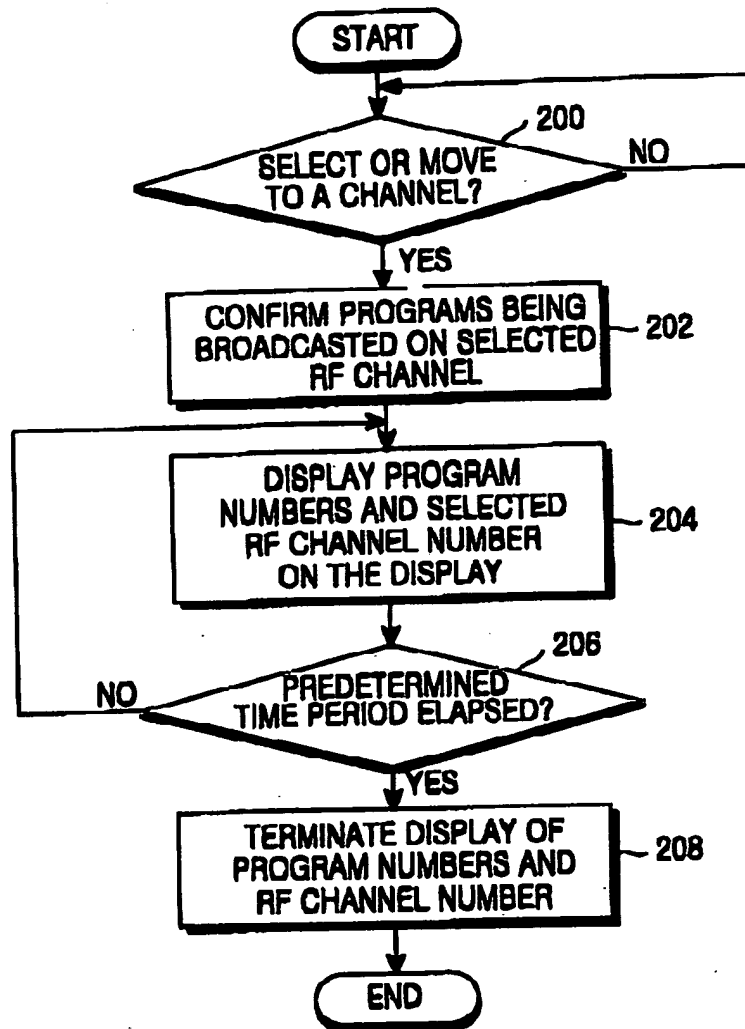


FIG. 2

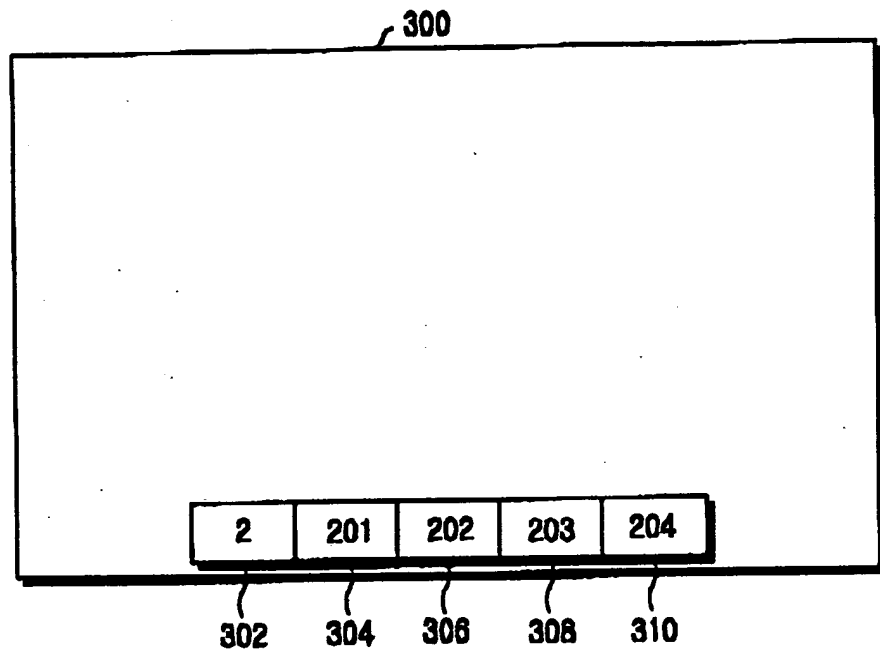


FIG.3